800 MHz Regional Planning Committee
Region 17

800 MHz Plan
Region 17
Checklist

1) Cover page - identifying the region

2) Chairperson - Name, address, phone number, and signature
See page 51.

3) Committee members - name, organizational affiliation, address, and phone numbers. See page 51.

4) Summary of major elements of the plan. See page 2-6.

5) General description of how spectrum is allotted among users.
See page 25.

6) Explanation of how the requirements of all eligibles are considered and met. See page 3.

7) Explanation of how eligibles are prioritized in areas where not all eligibles may receive licenses. See page 9.

8) Explanation of how the plan has been coordinated with adjacent regions. See page 14 .

9) Description of how the plan puts spectrum to best possible use by:

   I. Requiring system design with minimum coverage areas (see page 10)

   II. Assigning frequencies so that maximum frequency reuse and offset channel use may be made (see page 15)

   III. Making use of trunking (see page 8)

   IV. Requiring small entities with minimal requirements to join together on a single system where possible (see page 9)

10) Explanation of how interoperablitiy channels are managed (see page 17)

11) "Slow Growth" language. See page 23.

12) Does the plan refer to **Give-Back** frequencies? If yes, give page number 13.

13) Give the APCO sorting program. See page 15.

14) Appeal Process. See page 50.

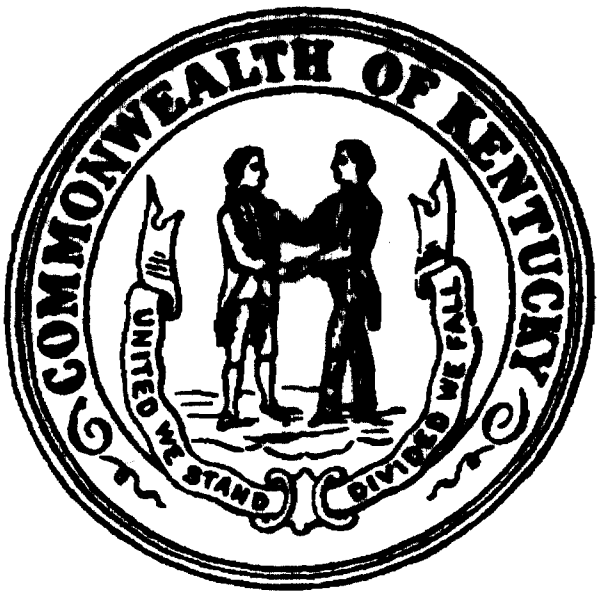
15) Does the plan provide for regional mutual aid channels, in addition to the five (5) common channels? If so, are there guard bands for these channels? See page 13.

16) Similar to the Generic Plan describe the formation of the committee;

I. Advertising - copy should be attached to legal notice, letters to the industry, etc. See Attachments # 1, 4, 5, & 6.

II. Who could vote? What procedure was used after first meeting? See page 2.

III. How was the final plan adopted? Was it by members attending a meeting or mail ballot? See Attachment # 1.



PUBLIC SAFETY RADIO

COMMUNICATIONS PLAN

for

THE STATE OF

KENTUCKY

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1.0 SCOPE

1.1 Introduction

In December of 1983, the United States Congress directed the Federal Communications Commission (FCC) to establish a plan to ensure that the communications needs of state and local public safety authorities would be met. By their regular means of initiation, the FCC began the process of developing such a plan. Through their efforts, and the efforts of the National Public Safety Planning Advisory Committee (NPSPAC) the plan was begun.

The National Public Safety Planning Advisory Committee provided an opportunity for the public safety community and other interested members of the public to participate in an overall spectrum management approach by recommending policy guidelines, technical standards, and procedures to satisfy public safety needs for the foreseeable future. After consideration of NPSPAC's Final Report and comments filed in Docket No. 87-112, a Report and Order was released by the FCC in December 1987, which established a structure for the National Plan that consists of guidelines for the development of regional plans. Six megahertz of spectrum was selected in the 821-824 and 866-869 MHz band, since they were already being used for public safety

distant future will not suffer from the problems of the past. The allocation of frequencies was done in as equitable a way as possible. The goal was to supply a pool of frequencies for each county and a pool for state agency use with adequate reserve allocations for future needs in all areas, and a method to appeal initial allocations based on need.

The National Plan, as developed by NPSPAC, was followed very closely in all considerations for frequency allocation, re- use, turn back, regional interoperability, spectrum requirements and adjacent region operations. This plan should provide the flexibility to accommodate the growth and changes which are bound to occur in public safety and public service communications operations long into the future.

2.0 AUTHORITY

2.1 Regional Planning Committee

The development of the Public-Safety Radio Communications Plan for Region 17, the State of Kentucky, has followed the requirements of the FCC's Report and Order as issued in the matter of General Docket 87-112.

In accordance with the FCC's Report and Order 87-112, the Associated Public-Safety Communications Officers Inc. (APCO) recommended to the Commission the appointment of a "Convenor" for Kentucky Region 17. The Convenor served as the coordinator for the assembly and formation of the planning committee.

Participants in the formation of the Regional Planning Committee represent interested parties from both the Public Safety and Special Emergency Radio

the Plan, the majority of those present at a scheduled meeting constituted a majority for all business. The final approval of the plan, prior to submission to the FCC, required a vote from a majority of members in attendance during the final review meeting. The plan was also discussed during a meeting of public safety officials on January 20, 1993 in Morehead, Kentucky. More than eighty individuals, representing all components of public safety agencies were present during this discussion. This way, the finished plan was reviewed and accepted by the widest, within reason , group of public safety/public service users.

2.2 Planning Committee Formation

The process of forming the Planning Committee was conducted in the following steps:

1. Personal interviews were held with the representatives of all major state agency radio users.

2. Presentations concerning the requirements for a regional planning

7. Vendors participation was encouraged, but vendors were not allowed a vote.

2.3 National Interrelationships

The Regional Plan is in conformity with the National Plan. If there is a conflict between the two plans, the National Plan will govern. It is expected that Regional Plans for other areas of the country may differ from this plan due to the broad differences in circumstance, geography, and population density. By officially sanctioning this plan the Federal Communications Commission agrees to its conformity to the National Plan. Nothing in the Plan is to interfere with the proper functions and duties of the organizations appointed by the FCC for frequency coordination in the Private Land Mobile Radio Services, but rather it provides procedures that are the consensus of the Public Safety Radio Services and Special Emergency Radio Service user agencies in this Region. If there is a perceived conflict then the judgment of the FCC will prevail.

2.4 Federal Interoperability

Interoperability between the Federal, State and Local Governments during both daily and disaster operations will primarily take place on the five common channels identified in the National Plan. Additionally, through the use of S -160 or equivalent agreements, a licensee may permit Federal use of a non-Federal communications system. Such use, on other than the five identified common channels, is to be in full compliance with FCC requirements for government use of non-government frequencies (Title 47 CFR, sec 2.103). It is permissible for a non-Federal government licensee to increase channel requirements to account for 2-10 percent increase in mobile units, dependent on the amount of Federal Government Agencies involvement in its area, provided that written documentation from Federal agencies supports at least that number of increased units.

2.5 Kentucky Regional Conformance Review Committee

Upon approval of this Plan by the Federal Communications Commission, a Kentucky Region Conformance Review Committee(KRCRC) will be established for the review of applications which do not fall within the stated guidelines provided for in this plan, or for the settlement of disputes concerning this plan and/or its application.

This committee shall consist of the Local APCO Frequency Advisor for this region, one representative from each of the current primary 800 MHz Planning Areas (Louisville, Lexington, Northern Kentucky area); five (5) representing state-wide public safety agencies (Kentucky State Police, Kentucky Department of Transportation, Kentucky Emergency Medical, Kentucky Disaster Emergency Services, Kentucky Fish and Wildlife); a member representing the Sheriff's Departments across the state; a member representing the office of City Police Chiefs; a member representing the Kentucky Chapter of APCO; and four (4) public safety at large members. Members representing the state agencies (KSP, DOT, DES, Fish and Wildlife) will be selected by the head of each of the specific state agencies. It will be suggested to the agency heads that the specific title of an individual, i.e. Director of Communications for that agency, be selected as the representative. Thereafter, as personnel changes occur within that position, the individual assuming those responsibilities for those state agencies will automatically become that agencies representative to the KRCRC. These terms will be non-expiring. The term of local APCO Frequency Advisor Committee Chairman is also non-expiring. The individual selected by Kentucky APCO to serve in the Frequency Advisor capacity will automatically be a member of the KRCRC.

The Sheriff's representative will be selected by the Kentucky Sheriff's Association, the Police Chief's representative will be selected by the Kentucky Police Chief's Association and the Kentucky APCO's representative will be selected by the Kentucky APCO Chapter. The representatives of the Kentucky Sheriffs, the Chief of Police and the Kentucky APCO will serve a term of one year. Those terms will begin on January 1 of each year and expire on December 31 of the same year. There is no prohibition against successive terms by the same representative from each of the Associations. In fact, during the early stages of the development of the 800 MHz systems within the Region, continuity of personnel could be highly advantageous.

Additionally, the KRCRC may select up to four (4) additional at-large members to represent various segments of the public safety community. Nominations may be submitted to the KRCRC by any public safety agency within the state. Any member of the KRCRC may also nominate candidates. All nominations received must include sufficient information regarding the applicant, their education and work experience background to permit an informed decision regarding the benefits to the KRCRC that selection of this candidate might provide. Candidates will be reviewed annually by the

KRCRC. If at-large membership is deemed beneficial for the responsibilities of the KRCRC, an election will be conducted at least sixty (60) days prior to the end of the calendar year. In order to be elected, a candidate must receive more than 50% of the votes from the number of members in attendance. In the event that more than four candidates are selected by the KRCRC, the four with the highest number of votes will be offered membership to the KRCRC. The term of office for the at-large members will be for one calendar year, from January 1 through December 31. At-large members may be nominated and

3.0 SPECTRUM UTILIZATION

This portion of the Plan provides a basis for proper spectrum utilization. Its purpose is to guide the Local APCO Frequency Advisor and/or the Regional Review Committee in their task of evaluating the implementation of this plan within this Region.

3.1 Region 17 Defined

Region 17 is the State of Kentucky. This region is the result of definition by the Federal Communications Commission as a result of recommendations made in the National Public Safety Planning Advisory Committee (NPSPAC) plan as submitted and approved and contained in Docket 87-112. For purposes of this plan the State of Kentucky shall be defined as all the lands and waters contained within the boundaries of the State of Kentucky.

3.2 Region Profile (Demographic Information)

The purpose of this section is to provide the basis for the assignment of frequencies, and their re-use. Since the frequency allocation formula used is based on population within a county, it is necessary to provide this information within this plan. The data used in the determination of frequency allocations is attached.(Attachment 2 & 3)

3.2.1 State Of Kentucky Population And Expected Growth Percentage. (See Attachment 3)

The population of Kentucky is 3,685,296. The urban population is some 60 percent and the rural 40 percent. The population within developed urban areas is about 60 percent or 2,211,177.

3.2.2 Geographical Description

There are 120 counties in the state with a total land mass of 40,395 square miles. The largest county is Pike County, with a total of 782 square miles. Water areas of significance are the lake areas such as Kentucky Lake, Lake Cumberland, Lake Barkley, etc. and many rivers which support many recreational endeavors.

As is shown above, the population of the state is 3,685,296 distributed across the land area contained in the state. This presents some problems in area coverage for radio systems in that the entire land area of any given jurisdiction must be covered. The population per square mile is somewhat sparse which generally indicates that the concentration of radio users for public safety activities is also sparse. All of these items were taken under consideration in the allocation plan.

3.3 Usage Guidelines

All systems operating within the Region having five or more channels will be required to be trunked. Those systems having four or less channels may be conventional or trunked.

The FCC, in its Report and Order states, "Exceptions will be permitted only when a substantial showing is made that alternative technology would be at least as efficient as trunking or that trunking would not meet operational requirements. Exceptions will not be granted routinely, however, strong evidence showing why trunking is unacceptable must be presented in support of any request for exception."

Systems of four or less channels operating in the conventional mode who do not meet FCC loading standards will be required to share the frequency on a non-exclusive basis.

Public Safety communications at the state level, as it impacts the Region, will be reviewed by the Committee. State-wide public safety agencies will submit their communications plans for impact approval if they utilize communications systems within the Region and those portions of such systems must be compatible with the Regional Plan.

The next level of communication coverage will be a county/multiple municipality area. Those systems that are designed to provide area communication coverage must demonstrate their need to require such wide area coverage.

This would apply in a situation such as a city requesting coverage of an entire county. Communication coverage beyond the bounds of a jurisdictional area of concern cannot be tolerated unless it is critical to the protection of life and

property. If the 800 MHz trunked radio technology is utilized, the system design must include as many county/multiple municipality government public safety and public service radio users as can be managed technically.

The county/multiple municipality agency(ies), depending upon systems loading and the need for multiple systems within an area, must provide intercommunications between area-wide systems. In a multi-agency environment, a lead agency using the 800 MHz spectrum, which is an agency or organization having primary response obligations in the geographic area, shall be responsible for coordinating the implementation the Common Channels in this band as mandated by the National Plan. Such implementation must be reviewed and approved by the Local APCO Frequency Advisor, and at his/her discretion, the Regional Review Committee.

Municipal terminology often differs. In order to provide a title for the next level of communications the term city-wide is used to define the level below county-wide. City-wide communications for public safety and public services purposes must provide only the communications needed within its boundaries. However, if the total number of radios in service does not reach minimum loading criteria for a trunked system, they must consider utilizing the next higher system level if 800 MHz trunked radio is available in the area. As those higher level systems reach capacity, the smaller system communicators in public safety and public service must then consider uniting their communications efforts to formulate one large system or forfeit use of the limited 800 MHz spectrum.

Where smaller conventional 800 MHz needs are requested, those frequencies to be utilized must not interfere with the region's trunked systems. The 800 MHz regional trunked radio system is to be considered the higher technology at this time and in greater compliance with FCC guidelines. The amount of interference that can be tolerated depends on the service affected. Personal life and property protection shall receive the highest priority and disruptive interference with communications involved in these services in an area shall not be tolerated. Any co-channel interference within an authorized area of coverage will be examined on a case by case basis by the Regional Review Committee.

3.4 Technical Design Requirements For Licensing

3.4.1 Definition of Coverage Area or Area of Jurisdiction

The coverage area shall be that area for which a system is intended to cover with a received signal strength of greater than 40 dBu. This area shall normally represent the boundaries of the County or the incorporated municipality which is applying for license. In the case of regional or area-wide, multi-jurisdictional systems, the coverage shall be that area of all jurisdictions participating in the system combined.

3.4.2 System Coverage Limitations

System coverage shall be limited to the coverage area defined as listed above plus no more than three (3) additional miles in all directions extending from said boundaries of definition. This limitation shall assure maximum frequency reuse. The only exception to this rule shall be those applicants wishing to offer service or system use to areas outside of their jurisdictional boundaries. In these situations the applicant shall provide a proposal of said service to the Local APCO Frequency Advisor, who may request Regional Review Committee consideration, for approval.

Systems not located within the geographical center of the jurisdiction(s) for which they cover shall utilize either directional antennas or antenna/tower relationship techniques to achieve the coverage required by this plan.

3.4.3 Determination Of Coverage

There are four variables used in determining the area of coverage of a proposed system. These variables are (1) the required strength of the received signal, (2) antenna height above average terrain (HAAT), (3) the effective radiated power (ERP) of the system, and (4) the type of environment.

Received Signal Strength:

For purposes of this plan, received signal strength shall be the determining factor which defines the actual boundary of a system. The minimum signal level which marks the outer boundary of a system shall be 40 dBu.

Antenna Height:

Shall be the height of the antenna above the average terrain surrounding the tower site.

Effective Radiated Power (ERP):

The ERP is the transmitter output power times the net gain of the antenna system. The actual formula is: ERP (w) equals Power(w) times Log (net gain in dB divided by 10).

Environment Type:

OKUMURA/HATA METHOD - The Okumura method uses four different classifications to describe the average terrain around a transmitter site or area. The classifications are:

1-URBAN; Which is built-up city-crowded with large buildings or closely interspersed with houses and thickly-grown trees. This would include the downtown area of a major city.

2-SUBURBAN; Which is a city of highway scattered with trees, houses and buildings. This would include the downtown area of a large city.

3-QUASI-OPEN; Is an area between suburban and open areas. This includes areas outside of city limits that have few buildings and houses.

4-OPEN; Is an area where there are no obstacles such as tall trees or buildings in the propagation path or a plot of land which is cleared of anything for 300 to 400 meters ahead. This would include farm land, open fields, etc.

Preparation of these requirements shall be the responsibility of the applicant. The Federal Communications Commission provides, in part 90.309(a)(4) of the Rules and Regulations, some additional guidance for these calculations.

3.4.4 Annexations And Other Expansions

It is well known that as cities grow, annexations occur. When an expansion of the present city limits of any city currently using an 800 megahertz system within the spectrum as herein specified occurs, it is understood that the existing system may have to be expanded and its range increased. This is a modification and may be permitted. The increased range of the system will have to be determined at the time of modification to assure non-interference with any other existing system. Where interference is likely, the use of alternate methods of expansion, such as satellite systems, may be necessary.

Should the annexation or expansion of a city effectively take in all or most of a county, the allocation for that county may be given to the city if required by said city and not in use or planned to be used by the county. Where more spectrum is not available from the initial allocation, the rules for expansion of initial allocation, as contained in this plan, shall apply.

3.4.5 Coverage Area Description

All applicants shall provide with their applications a map showing the jurisdictional boundaries to be covered by the system, and the calculated system coverage. This map shall display the location of the system transmitter(s), including control stations. It is recommended that a U.S.

allowed above 3,000 feet AGL on wide area mutual aid channels.

Simplex (talk around) operations of aircraft radios shall be utilized for on-scene communications. Co-channel and adjacent channel users are not required to provide protection to airborne users.

3.4.7 Give-Back Frequencies

All agencies participating in the use of the any 800 megahertz spectrum shall prepare and submit a plan for the abandonment of their currently licensed frequencies in the lower bands. These released frequencies shall be available for reassignment to those agencies not migrating to 800 MHz at this time. These released frequencies shall be returned to the radio service from which it was assigned. These frequencies shall then be available for reassignment by the assignment/coordination criteria in effect for that particular service by the regular FCC authorized coordinator for that service.

Mutual aid channels, intersystem channels and other emergency channels are:

155.370 MHz Police Point-to-Point
155.475 MHz Police Mobile-to-Mobile
155.340 MHz EMS Mobile-to-Hospital
155.280 MHz EMS Hospital-to-Hospital
154.280 MHz Fire Mutual Aid
155.220 MHz EMS Dispatch Common
155.160 MHz EMS Dispatch Common

These frequencies used by Public Safety and Special Emergency Radio Services as designated by Kentucky State Government Planning are exempt from the relinquishment requirement.

Frequencies which are to be abandoned by an agency shall not be handed down to another agency within the respective jurisdiction. Though this may seem a convenient method to re-use existing radio equipment, the reassignment must be handled through the normal process. It is recommended that any jurisdiction wishing to "hand down" frequencies to another agency submit the proper coordination and application forms with the document of release. This will put the applicant in a better posture for reassignment of the frequency in question. It should be noted that even though this procedure is followed, there

is no guarantee that a particular frequency will be assigned to the returning jurisdiction.

The time frame allowed for phasing into 800 MHz and out of the lower currently licensed bands will be considered on a case by case basis by the review committee. Generally, one year will be considered acceptable in most cases, with two years as a maximum. Any agency requiring more than two years shall provide documents stating the reasons for the delay, and give the estimated time of completion.

3.4.8 Unused Spectrum

Due to the fact that all of the frequency spectrum is not needed at this time, the excess channel pairs will be returned to a reserve pool. These channels may be used for conflict with adjacent Region allocations or may simply remain within this Region until needed. This does not imply that these frequencies are unavailable, only that before they can be utilized within the Region they must be coordinated via the regular APCO coordination process and within the guidelines set forth in this plan . Where possible, the channels designated for a jurisdiction in this plan shall be used.

3.4.9 Adjacent Region Coordination's

Coordination with adjacent regions shall be an on-going process until all region plans have been finalized. At present, all adjacent regions have been coordinated with and no conflicts have been identified. The adjacent regions with which coordination has been conducted are: Indiana (Region

3.5 Initial Spectrum Allocation

3.5.1 Frequency Sorting Methodology

The initial spectrum allocation for Kentucky was determined by a computerized frequency sorting process performed by APCO. The purpose of the computer program which assigns frequencies to specific eligibles and to pools for future assignments is two-fold:

A) The assignments must result in a high degree of spectrum efficiency, and

B) The assignments must result in a low probability of co- channel and adjacent channel interference.

Since the desired output is a geographic sorting of frequencies, a method of defining geography must be part of the input. A list of the number of channels to be assigned in each geographic area is also required, along with the name of the eligible or pool.

Acceptable interference probabilities are determined for the Region. Frequency assignments are then made using a computer program which satisfies the goals of spectrum efficiency and interference protection. The following narrative describes the factors and process used by the computer program.

3.5.2 Geographic Area

For the purpose of this frequency sort, a geographic area is defined as one or more circles of equal radius. To the degree practical, the circle(s) should include the entire area of the eligible's geopolitical boundary, but not exceed the boundary by more than three (3) miles. Thus, the procedure is to gather maps of sufficient detail, outline the areas to be defined, determine the coordinates and radius of the circles which define each area, and tabulate the data.

3.5.3 Define The Environment

The environment of each system is defined according to the Okumura/Hata method of classifications. See Section 3.4.3.

3.5.4 Blocked Channels

In the Region there are five mutual aid channels which must be blocked out to prevent the computer from making assignments on these channels. (Since the mutual aid channels are spaced at 0.5 MHz intervals, other Region-wide systems are spaced at 0.5 MHz and placed adjacent to the mutual aid channels. This procedure reduces the impact of blocked adjacent channels by virtue of the fact that the channel plan already has protection spacing on each side of the mutual aid channels.) These Region-wide blocked channels are identified by FCC channel number, tabulated and they become input to the computer program.

3.5.5 Transmitter Combining

The computer program is designed to provide a minimum frequency separation between any two channels assigned to the same eligible at the same site. This separation is provided in order to enable more efficient combining of multiple transmitters to a single antenna. These separated blocks of frequencies also have a maximum size. That is, if the eligible has more frequencies than the maximum size of the combining block, then a second compatible block is created, and so on. Each of these parameters is adjustable in the program on a

3.5.8 Protection Ratios

There are two interference protection ratios built into the computer program. One is for the co-channel case, the other is for the adjacent channel case. The ratios provide 35 dB Desired/Undesired signal ratio for co-channel assignments, and 15 dB Desired/Undesired ratio for the adjacent channel case. These ratios provide an acceptable probability of interference for Public Safety Services.

3.5.8 Adjacent Region Coordination

The computer program requires a listing of channels to be blocked along the bordering with other regions which have pre-existing plans. If the adjacent

applicable within a system. Large system users (5 channels or more) of 800 MHz shall be required to monitor this channel at all times. The area of coverage for this channel shall be equal to the area covered by the licensed system. This may or may not require the use of satellite receivers within the area to meet this requirement.

The four International Tactical (ITAC) Channels will be assigned State-wide, for use as needed by all eligible licensees. These channels are to be used in accordance with the National Plan and in compliance with the regulations as set forth by the Federal Communications Commission. These channels require no special licensing, only that the users be eligible for licensing on the other Public Safety 800 MHz channels as specified in section 90.616 (a) of the FCC Rules and Regulations.

4.1.1 Areas of Operation

The common channels shall be available for use throughout the Region. No specific assignments were deemed necessary within the Region.

4.1.2 Operation on The Common Channels

Normally, the five interoperable channels are to be used only for activities